INSTRUCTION BULLETIN

No. 340829
Machine: M20
Published: 11-2006
Rev. 01

NOTE:Numbers in parenthesis ( ) are reference numbers for parts listed in Bill of Materials.

Installation instructions for **kit number 9003091**

SYNOPSIS:

This kit contains the parts needed to install the M20 new product launch update kit. Please follow step-by-step instructions.

SPECIAL TOOLS / CONSIDERATIONS: Loctite® 242

(Estimated time to complete: 5 hours)

PREPARATION:

1. Park the machine on a clean level surface, turn off the machine, remove the key, and set the parking brake.

FOR SAFETY: Before leaving or servicing machine, stop on level surface, set parking brake, turn off machine, and remove key.

2. Open the front shroud.

3. Disconnect the negative (BLACK) terminal from the battery.

WARNING: Always disconnect battery cables from machine before working on electrical components.

4. Open the engine shroud and lift the shroud from the machine.

5. Unhook the latch from the hydraulic fluid cooler bracket and pull the hydraulic fluid cooler forward. Refer to Fig. 1.

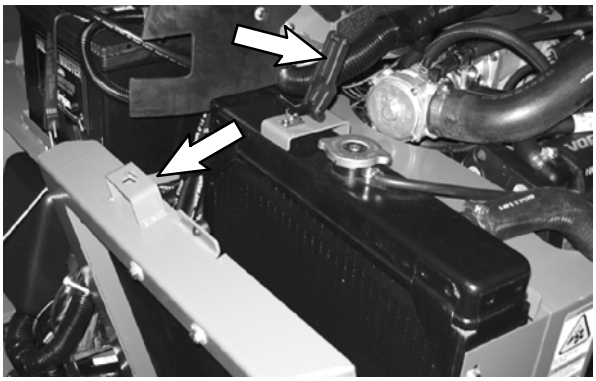

FIG. 1

6. Place a drain pan under the radiator, position the drain hose attached to the drain cock (A) located underneath the radiator into the drain pan, and open the drain cock to drain coolant from the radiator. Drain the radiator until the fluid level in the radiator is below the hoses attached to the top of the radiator. Refer to Fig. 3.

FOR SAFETY: When servicing machine, avoid contact with hot engine coolant.

FOR SAFETY: When servicing machine, do not remove cap from radiator when engine is hot. Allow engine to cool.

7. Remove the fan shroud guard plate (B) from the radiator assembly. Set the guard plate and all mounting hardware (V) aside. Refer to Fig. 3.

8. Remove the engine access panel from the operator compartment. Set the access panel and hardware aside. Refer to Fig. 2.

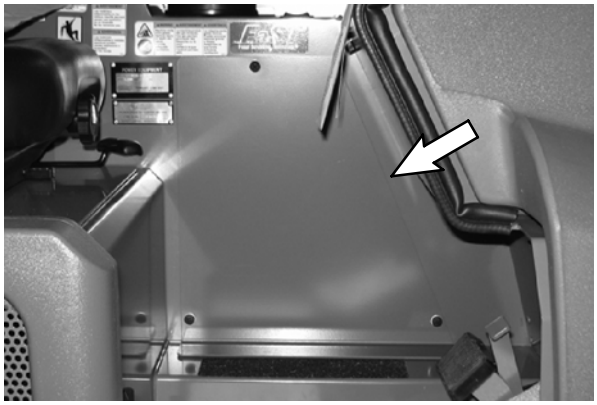

FIG. 2

Loctite® is a registered trademark of the Henkel Corporation.

9. Remove the air deflector plate (P) from the fan panel shroud (D). Set the hex screws (Q) aside. Discard the air deflector plate. Refer to Fig. 3.

10. Disconnect hoses (F) and (G) from the radiator. Position hoses out of the way so coolant does not leak out onto the engine or the floor. Set the hose clamps aside. Refer to Fig. 3.

11. Remove the two nuts and washers (H) holding the bottom of the radiator to the machine. Set the the nuts and washers aside. **Do Not** lose the washers. Refer to Fig. 3.

12. Remove the hardware (C) holding the fan shroud panel (D) to the radiator (E). Set all removed hardware (C) aside. Refer to Fig. 3.

13. Carefully move the radiator forward and out of the way of the fan assembly. Do not completely remove the radiator from the machine. Refer to Fig. 3

14. Use a 5/16" Allen wrench to remove the hardware (I) holding the fan (J) onto the engine and remove the fan. Discard the fan and hardware. Refer to Fig. 4.

15. Remove the fan shroud panel (D) from the machine. Remove the latch assembly (R) and radiator seal assembly (S) from the fan panel shroud. Set the latch assembly, radiator seal seal, and mounting hardware (T) and (U) aside. Discard the fan shroud panel. Refer to Fig. 3.

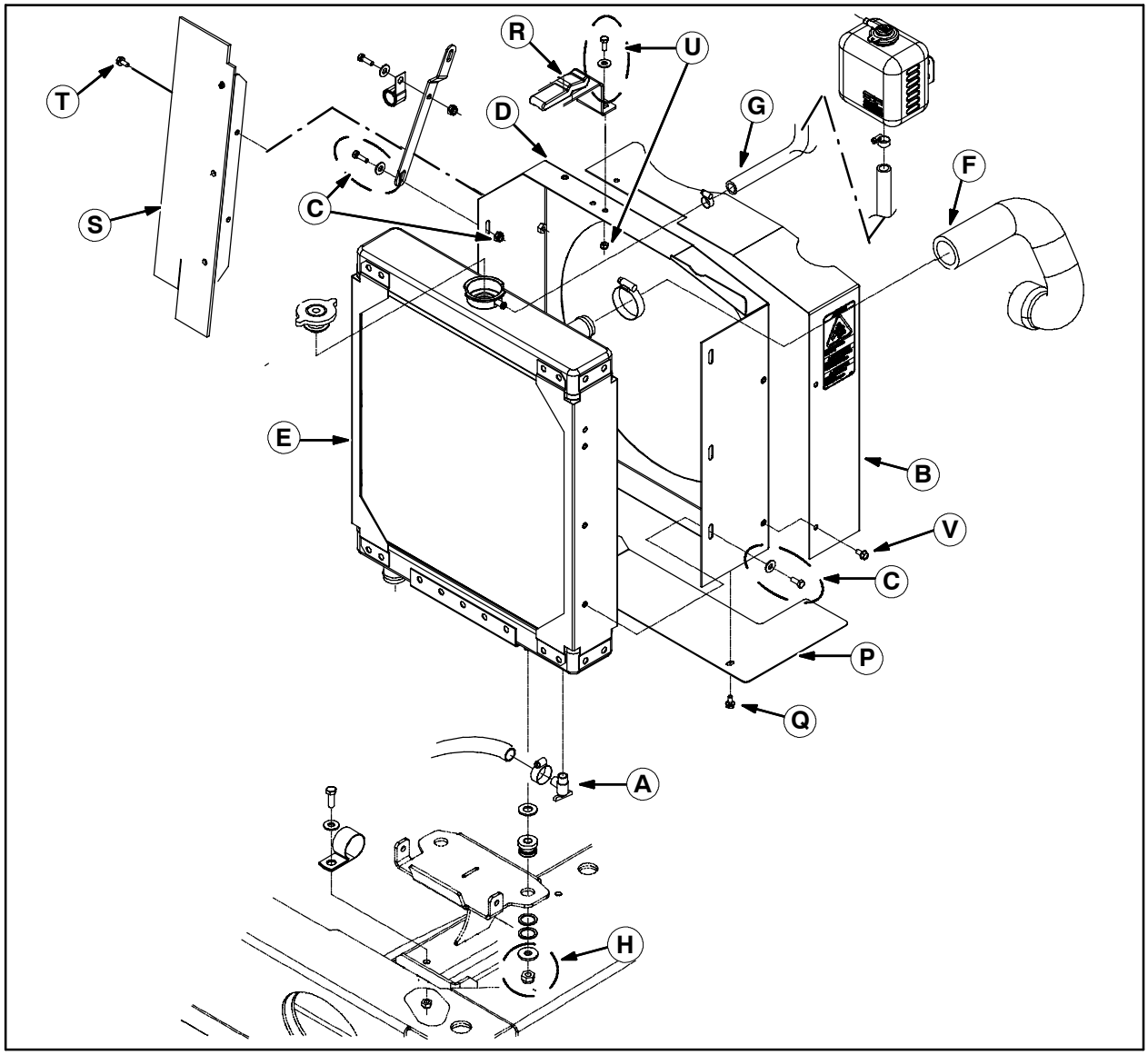

FIG. 3

16. Relieve the fan belt tension at the alternator (K) and remove the fan belt (L) from the machine. Discard the fan belt. Refer to Fig. 4.

17. Remove the spacer (M) and sheave (O) from the fan base (N) If necessary, use a chisel and hammer to knock the spacer (M) loose from the engine shaft (N). Be careful to not damage the fan base if using a chisel. Refer to Fig. 4.

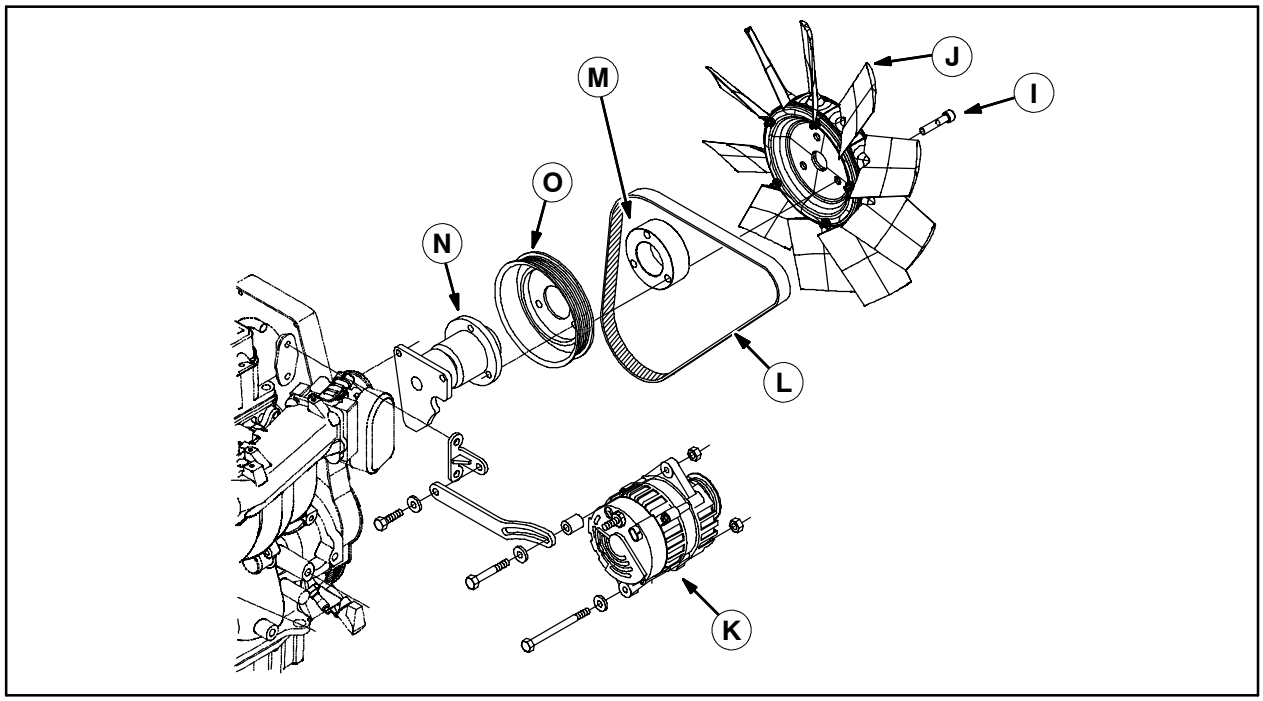

FIG. 4

INSTALLATION:

1. Use the saved hardware (T) and (U) to attach the latch assembly (R) and radiator seal assembly (S) onto the new fan shroud panel (16). Refer to Fig. 3.

2. Apply Loctite 242 to the saved hex screws (Q) and use the hex screws (Q) and three fender washers (24) to install the radiator debris skirt (17) onto the fan shroud panel (16). Refer to Fig. 5.

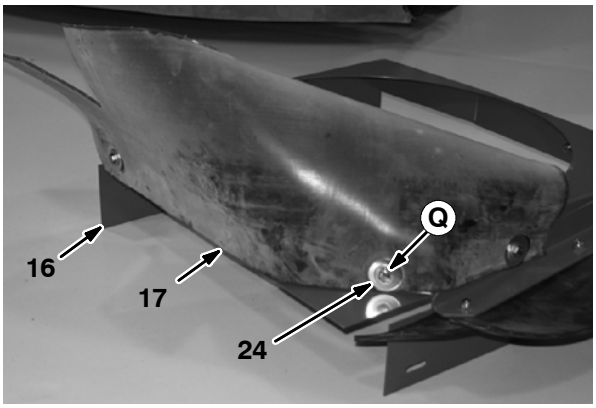

FIG. 5

3. Place the new fan shroud panel (16) next to the radiator, where the old fan shroud panel was previously installed. Refer to Fig. 3.

4. Align the holes in the new sheave (8) and fan spacer (1) with the holes in the fan base (N) and slide the sheave and fan spacer onto the fan base. Refer to Fig. 6.

5. Apply Loctite 242 to the three flat screws (6) and use the flat screws to secure the fan spacer (1) to the sheave (8). Torque to 21.7–28.5 Nm (16–21 ft. lbs). Refer to Fig. 6.

6. Install the new belt (3) onto the engine and tighten the belt so there is only a slight bit of tension. Refer to Fig. 6.

7. Install the new fan (2) onto the fan spacer (1). Be sure the nuts holding the fan together point out towards the radiator and the three threaded holes in the fan are aligned with the three threaded holes in the fan spacer. Refer to Fig. 6.

8. Apply Loctite 242 to the hex screw (5) and use the hex screw and belleville washer (4) to secure the fan (2) onto the fan base. Torque to 13–16.5 Nm (9.6–12.2 ft. lbs). Be sure the three threaded holes in the fan remain aligned with the three threaded holes in the fan spacer (1). Refer to Fig. 6.

9. Apply Loctite 242 to the three pan screws (7) and use the pan screws to secure the fan (2) to the fan spacer (1). Torque to 3.3–4.3 Nm (2.4–3.2 ft. lbs). Refer to Fig. 6.

10. Use the saved nuts and washers (H) to reinstall the radiator onto the machine. Refer to Fig. 3.

11. Use the saved hardware (C) to reinstall the shroud panel (D) onto the radiator. If necessary, loosen the latch assembly (R) to make installing the inner hardware easier. Do not completely tighten the hardware. Refer to Fig. 3.

12. Be sure fan is centered in shroud before tightening the hardware. Manually spin the fan by hand to ensure the fan does not hit the radiator or the shroud.

13. Tighten the belt (3). Refer to Fig. 6.

14. Reattach the hoses (F) and (G) removed from the top of the radiator. Refer to Fig. 3.

15. Use saved hardware (V) to install the fan shroud guard plate (B) onto the fan shroud panel (16). Refer to Fig. 3.

16. Reinstall the engine shroud.

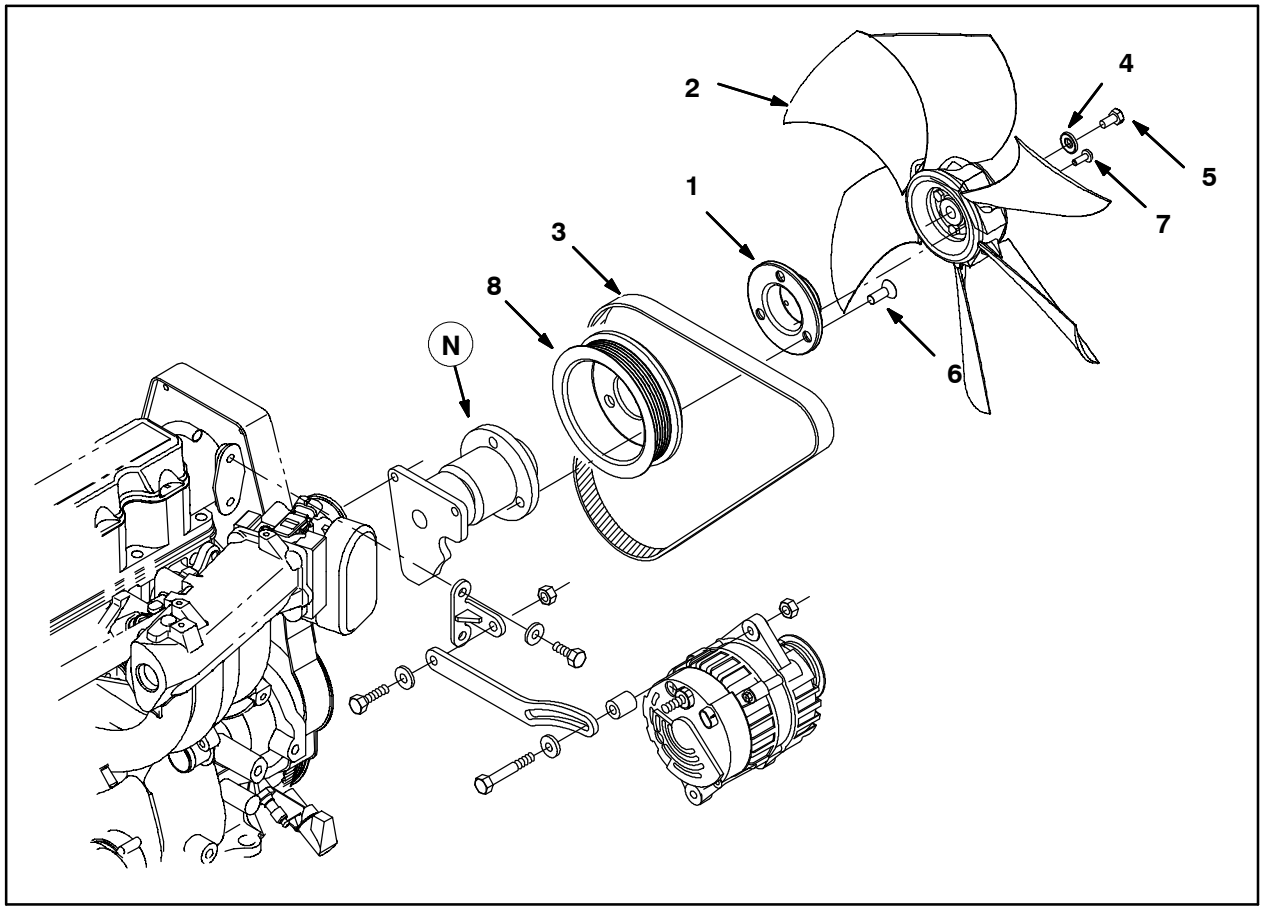

FIG. 6

17. Remove the grill from the front shroud. Save all hardware used to secure the old grill onto the shroud. Discard the grill. Refer to Fig. 7.

18. Use the saved hardware to install the new grill (9) onto the front shroud. Refer to Fig. 7.

19. Apply Loctite 242 to the seals (11) and install the seals onto the inner portion of the grill (9). Refer to Fig. 7.

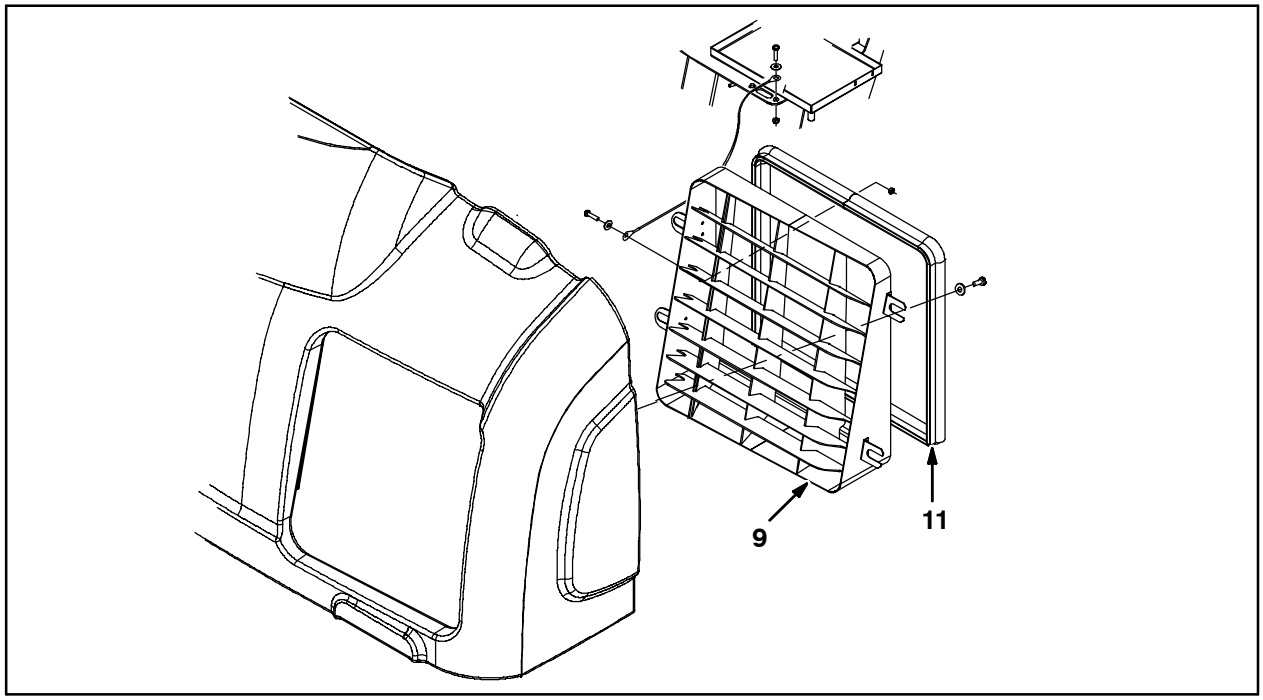

FIG. 7

20. Remove the cap from the hydraulic reservoir. Refer to Fig. 8.

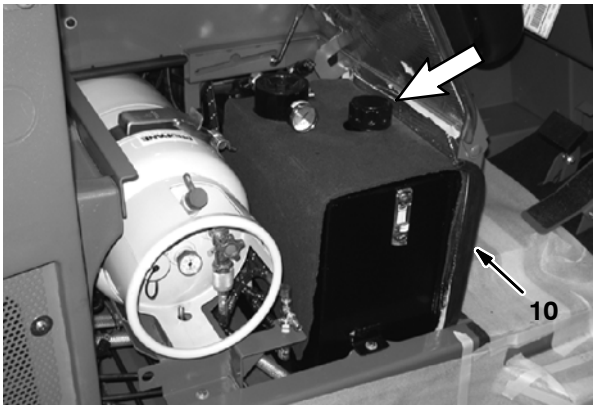

FIG. 8

21. Install the thermal insulation blanket (10) over the hydraulic reservoir and reinstall the cap onto the hydraulic reservoir. Refer to Fig. 8.

22. Install the labels (12) and (25) onto the hydraulic reservoir. Refer to Fig. 9.

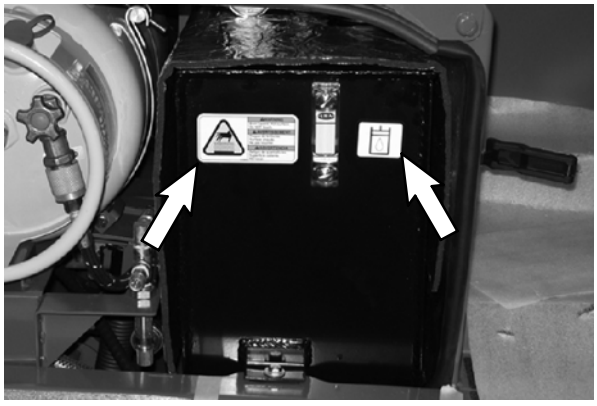

FIG. 9

23. Reconnect the battery cables to the batteries.

24. Refill the coolant system. Refer to the *ELIMINATE AIR FROM AND FILL THE COOLANT SYSTEM* section of this IB for how to bleed and fill the coolant system.

PROPEL HOSE ADJUSTMENT, MAIN WIRE HARNESS CLAMP INSTALLATION, AND COOLANT TUBE CLAMP INSTALLATION:

1. Start the machine and turn the steering wheel completely to the left and then to the right. Inspect the portion of the hydraulic propel hose near the alternator. The hose must not touch or be rubbing against the alternator, alternator bracket, or hardware when the steering wheel is turned in either direction. Proceed to Step 2 if the hoses are touching or rubbing against any part of the alternator. Proceed to Step 6 if the hoses are not rubbing against or touching the alternator. Refer to Fig. 10.

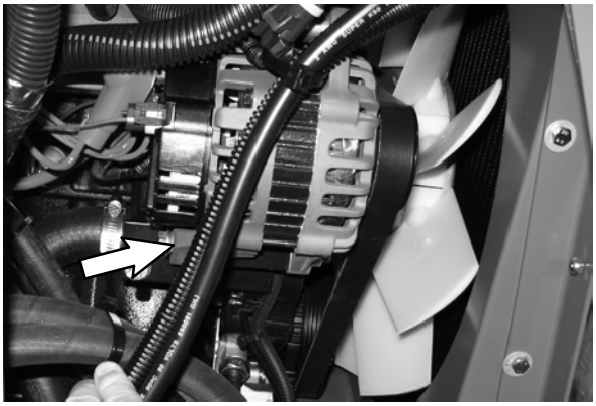

FIG. 10

2. Disconnect the battery cables from the batteries.

3. Lift the operator seat and remove the LPG tank (if machine is equipped with LPG fuel system) to access the hose clamp located on the inner side of the operator compartment. Refer to Fig. 11.

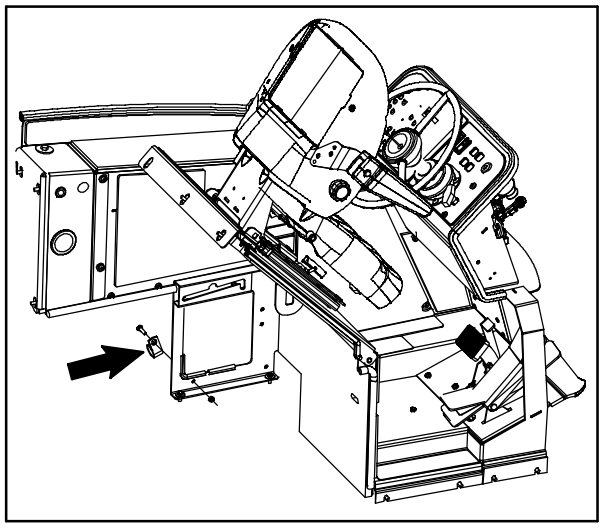

FIG. 11

4. Slightly loosen the hose clamp and reposition the hydraulic propel hose so the yellow line on the hose is positioned either 1” above or below the clamp. Refer to Fig. 11 and Fig. 12.

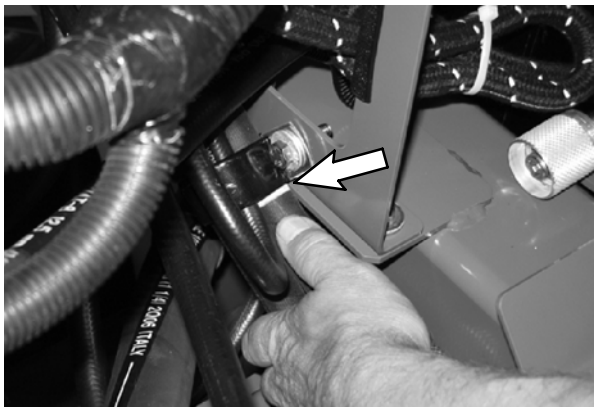

FIG. 12

5. Retighten the hose clamp loosened in the previous step. Refer to Fig. 11 or Fig. 12.

6. Insert the main wire harness into the cable clamp (13) and use a hex screw (15) and flat washer (14) to secure the main wire harness to the engine, away from the alternator. Refer to Fig. 13.

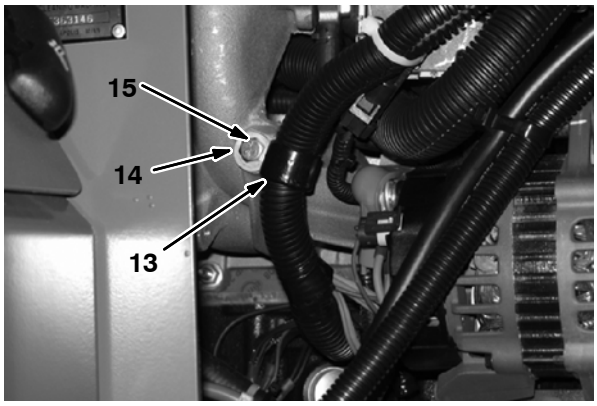

FIG. 13

7. Remove the one hex screw and flat washers holding the alternator bracket to the machine. Set the hex nut aside. Discard the flat washer. Refer to Fig. 14.

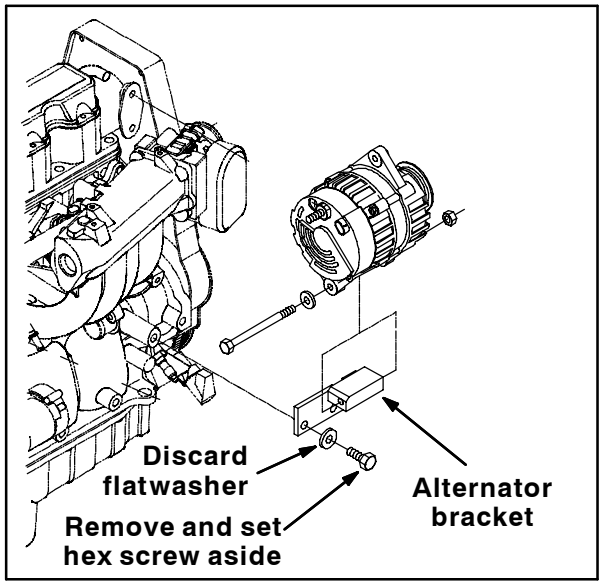

FIG. 14

8. Stretch the loose end of the radiator debris skirt (17) tight over to where the hex screw was removed in the previous step and use the saved hex screw and a flat washer (23) to secure the radiator debris skirt to the alternator bracket. The radiator debris skirt must be stretched tight so it does not get sucked into the fan or belt. Refer to Fig. 15.

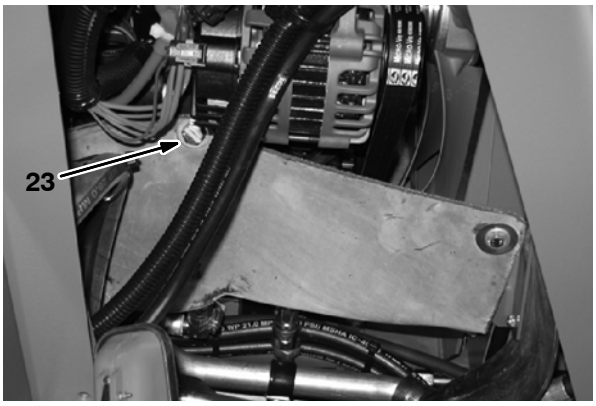

FIG. 15

9. Inspect the red boot on the alternator. The boot should be firmly attached to and completely cover the terminal. Tighten a wire tie around the boot to secure the boot onto the wires attached to the alternator. Refer to Fig. 16.

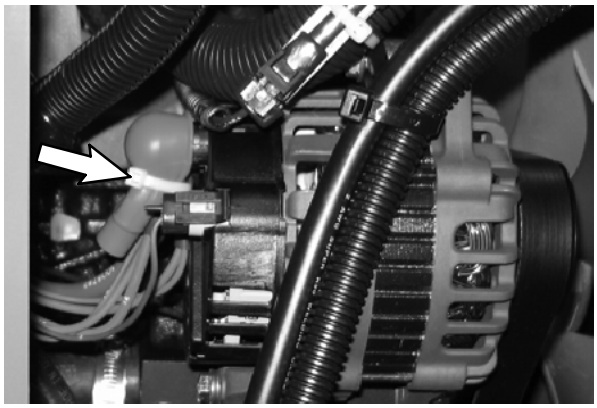

FIG. 16

10. Connect the battery cables to the batteries.

11. Start the machine and turn the steering wheel as far to the left as possible.

12. Install the cable clamp (20) onto the lower coolant tube and use a hex screw (22) a hex nut (21), and a washer (18) to loosely install the coolant tube bracket (19) onto the cable clamp (20). Refer to Fig. 17 and Fig. 18.

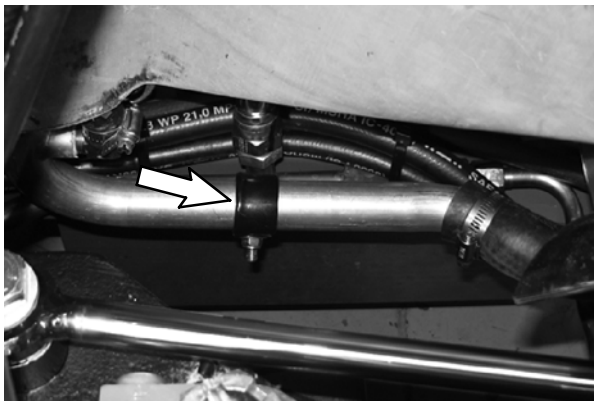

FIG. 17

FIG. 18

13. Drill a 3/8” hole through the hole in the coolant tube bracket (19) and into the frame of the machine. Refer to Fig. 18.

14. Use a hex screw (22) a hex nut (21), and a washer (18) to secure the coolant tube bracket (19) to the frame of the machine. Also tighten the hex screw (22) and hex nut (21) to firmly secure the cable clamp (20) to the coolant tube bracket (19). Refer to Fig. 19.

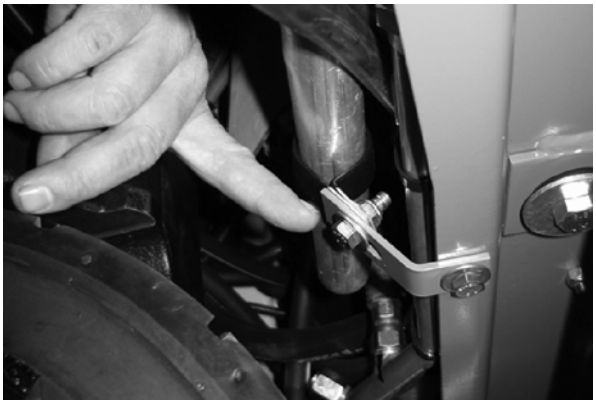

FIG. 19

INSPECT ANGLE OF FITTING AT M1 ON SCRUB BLOCK:

15. Remove the port cover from Port G1 on the the scrub block. Refer to Fig. 20.

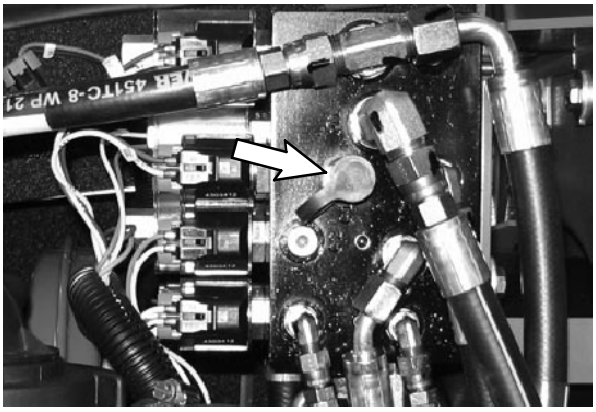

FIG. 20

16. Hold a quick-disconnect fitting up to Port G1 on the scrub block. **DO NOT** install the quick-disconnect fitting into the port. The fitting in Port M1 on the scrub block should be positioned next to the quick-disconnect fitting held onto Port G1 as shown in Fig. 21.

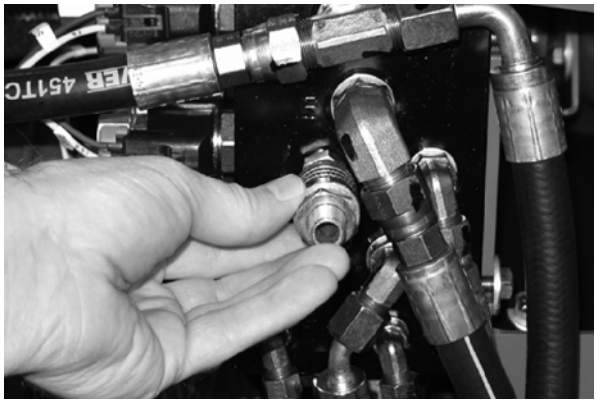

FIG. 21

17. If necessary, rotate the fitting in Port M1 on the scrub block toward the quick-disconnect fitting. Allow just enough clearance to engage/ disengage the quick-disconnect fitting. Refer to Fig. 21.

18. Reinstall the access panel into the operator compartment. Refer to Fig. 2.

19. Discard the old parts manual (REV. 00) and replace it with the new updated parts manual (REV. 01) (26).

20. Reconnect the battery cables to the batteries.

21. Start and test the machine.

22. If the fitting in Port M1 on the scrub block was rotated, check the fitting for leaks. Refer to Fig. 21.

ELIMINATE AIR FROM COOLANT SYSTEM AND FILL COOLANT SYSTEM:

FOR SAFETY: When servicing machine, avoid contact with hot engine coolant.

FOR SAFETY: When servicing machine, do not remove cap from radiator when engine is hot. Allow engine to cool.

1. Position a bucket or drain pan underneath the clear PVC tubing attached to the drain cock to prevent the fluid draining from the drain cock from running onto the floor.

2. Open the drain cock. Refer to Fig. 22 for the location of the drain cock on LPG machines and Fig. 23 for the location of the drain cock on gasoline machines.

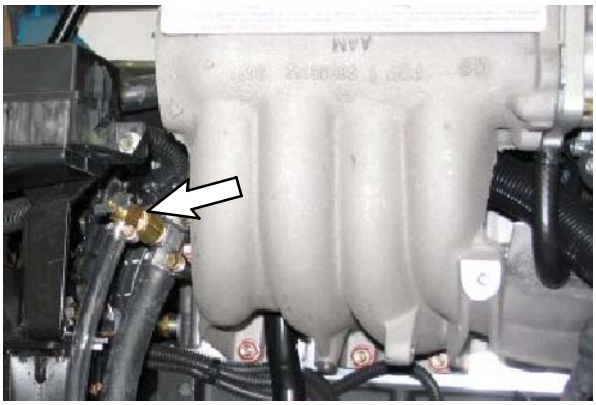

FIG. 22

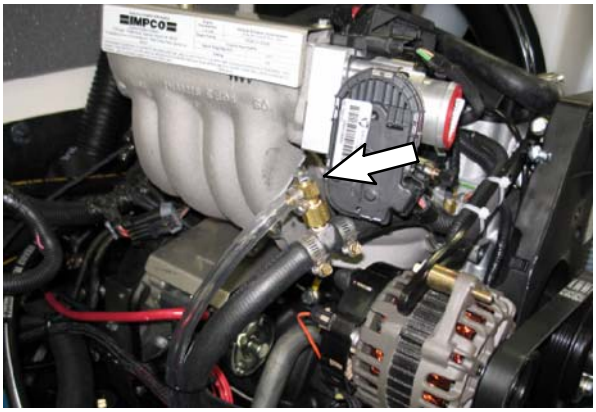

FIG. 23

3. Remove the cap from the radiator and slowly pour coolant into the radiator. Continue pouring coolant into the radiator until a steady solid stream of coolant drains from the drain cock.

4. Quickly close the drain cock while the steady solid stream of coolant is draining.

5. Remove the cap from the overflow tank and pour coolant into the overflow tank until the level reaches the “FULL WHEN COLD” mark. Reinstall the cap back onto the overflow tank.

6. Pour additional coolant into the radiator. Note: It should be possible to add coolant to the radiator. If the radiator appears full, there may still be air in the system. Repeat Step 2 through Step 6.

7. Ensure radiator cap **IS NOT** on the radiator. If necessary, remove the cap from the radiator.

8. Start the engine and allow the machine to run for approximately 5 minutes.

WARNING: Moving belt and fan, Keep away.

FOR SAFETY: Avoid moving parts. Do not wear loose jackets, shirts, or sleeves when working on machine.

9. Turn off the engine.

10. Check the coolant level in the radiator. If necessary, pour additional coolant into the radiator.

11. Reinstall the radiator cap onto the radiator.

12. Start engine and allow machine to run for approximately 5 minutes. If the engine warning light comes on, repeat the entire procedure. If the engine warning light comes on after procedure is repeated, check the codes. Refer to the service manual for instructions how to check codes.

SERIOUS ENGINE DAMAGE COULD RESULT IF THIS PROCEDURE IS NOT FOLLOWED!

Bill of Materials for Modif Kit, Hi-Amb Heat-9003091

	Ref.	Tennant Part No.	Description	Qty.
▽		9003091	Modif Kit, Hi-Amb Heat	1
▲	1	1032242	Spacer, Fan [6600/6650 07]	1
▲	2	1035031	Fan, Cooling, Pusher, 15.50D [2007]	1
▲	3	1033644	Belt, Ribbed, 38.5L	1
▲	4	41186	Washer, Flat, Belleville, .31	1
▲	5	16735	Screw, Hex, M8 X 1.25 X 16, 8.8	1
▲	6	48998	Screw, Flat, .38-16 X 1.00, Al	3
▲	7	09145	Screw, Pan, M6 X 1.00 X 16, 4.8	3
▲	8	1033428	Sheave, 5.00D [GM1.6L 2007]	1
▲	9	1035068	Grill Wldt, Front	1
▲	10	1034878	Insulation, Thermal, Hydraulic Blanket	1
▲	11	1031557	Seal, Afmkt, Bulb, Str, 1.00D F/11ga 08 ft	1
▲	12	1017141	Label Set, Hi Temp	1
▲	13	69234	Clamp, Cable, Stl, 1.00D X 0.75W, 1 Hole	1
▲	14	32491	Washer, Flat, 0.31, Std	1
▲	15	16931	Screw, Hex, M8 X 1.25 X 20, 8.8	1
▲	16	1021287	Panel, Shrd, Fan, Gas/LPG	1
▲	17	1035222	Skirt, Debris, Engine Radiator	1
▲	18	01685	Washer, Flat, 0.38B 0.88D .08, SS	3
▲	19	1035214	Bracket, Tube, Coolant [M20/T20]	1
▲	20	58366	Clamp, Cable, Stl, 1.25D X 1.00W, 1 Hole	1
▲	21	08713	Nut, Hex, Lock, M8 X 1.25, NL, SS	2
▲	22	09740	Screw, Hex, M8 X 1.25 X 20, SS	2
▲	23	32492	Washer, Flat, 0.38, Std	1
▲	24	41178	Washer, Flat, 0.25, Fendr	3
▲	25	19207	Label, Info, Hyd Fluid, NA/CE	1
▲	26	331381	Manual, Parts [M20 Gas/LPG En/Jp]*	1

**Discard old parts manual and replace it with new updated parts manual (26).*

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